

A first dielectric wall and a second dielectric wall in which hollow alumina cylindrical columns are arranged in a layered form so that the axial centers of the alumina cylindrical columns have planar triangular lattice arrays, are opposed to each other in parallel with air interposed therebetween. Metal plates are opposed to each other with both end faces of the alumina cylindrical columns constituting the first dielectric wall and the second dielectric wall being interposed therebetween. Further, the first and second dielectric walls and the metal plates are bonded to one another, whereby a high-frequency waveguide is configured which is reduced in radiation loss, inexpensive and low in transmission loss.